

EXAMPLE BURN PLAN ADDRESSING AIR RESOURCE IMPACTS FROM PRESCRIBED FIRE SMOKE

LAST UPDATED: April 4, 2003

ELKHORN WILDLIFE MANAGEMENT BURN PROJECT

Wise River Ranger District
Beaverhead – Deerlodge National Forest
USFS Region 1


Prepared By: _____ Title: _____ Date: _____

Reviewed By: _____ Title: _____ Date: _____

Reviewed By: _____ Title: _____ Date: _____

Approval of this plan constitutes the authority to burn under the specific set of conditions as outlined herein.
Actions taken in compliance with the approved plan will be fully supported.

COMPLEXITY LEVEL

Following is the complexity level which has been designed for this plan. If this plan is rated as Complex, the rating is based on: Management Objectives: _____ Risk of Escape: _____ Season: _____
Private Land: _____ Aerial Ignition: _____  Smoke Management: _____ Other: _____

Complex _____ Intermediate _____ Non-Complex _____

Approved By: _____

Date: _____

District Ranger

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DISCLAIMER

This example burn plan represents a comprehensive approach to fully disclosing the potential air quality impacts caused by smoke from prescribed burning at the burn project level. The appropriate level of analysis for each burn project will vary with the size and complexity of the project. Air quality information may be provided in the project environmental assessment (EA) or environmental impact statement (EIS) and simply referenced in the project burn plan. Readers will need to decide for themselves the level of air quality analysis required for their burn project on a case-by-case basis, and where that information should be cited.

This example approach and burn plan outline is not required, nor does it fulfill any provisions or regulations associated with the State of Montana Open Burning regulations at ARM 17.8.601 et seq., or major source burn permit requirements. The Montana Department of Environmental Quality retains the discretion to propose alternative / additional regulatory approaches to disclosing air quality impacts caused by smoke from prescribed burning, subject to appeal by the Montana Board of Environmental Review.

Questions, comments, or suggestions on how to improve this document is encouraged. Forward specific comments regarding this document to Bob Habeck, Supervisor of the Air Quality Planning and Standards Section, Montana Department of Environmental Quality, (406) 444-7305 or bhabeck@state.mt.us.

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PREScribed BURNING PLAN SUMMARY

UNIT NAME(S): _____

LEGAL DESCRIPTION(S): _____

 SMOKE MANAGEMENT STAG NUMBER(S): _____

NUMBER OF ACRES: _____

ELEVATION: _____ SLOPE (%): _____ POSITION: _____

FIRE GROUP TYPE: _____

FUELS:	Natural _____	0 - ¼" _____	T/A	TYPE OF BURN:	Broadcast _____
	Activity _____	¼ - 1" _____	T/A		Underburn _____
		1 - 3" _____	T/A		Wildlife _____
		3+ " _____	T/A		Other _____
		TOTAL _____	T/A		

FUEL MODEL (NFFL / CUSTOM):	Inside _____	BURN CATEGORY:	Complex _____	MOP-UP STANDARDS:	Category 1 _____
	Outside _____		Intermediate _____		Category 2 _____
			Non-Complex _____		Category 3 _____

ESTIMATED COST / ACRE: _____ RANGE OF ACCEPTABLE RESULTS: _____
(described below)

ACTUAL COST / ACRE: _____

OBJECTIVES:


- Hazard Reduction _____
- Site Preparation _____
- Wildlife _____
- Range _____
- Other _____

PRESCRIPTION:

Fireline Intensity _____	to _____	Flame Length _____	to _____
Rate of Spread _____	to _____	Windspeed _____	to _____
Temperature _____	to _____	Humidity _____	to _____
Fuel Moisture (%):	1 HR _____ to _____		
	10 HR _____ to _____		
	100 HR _____ to _____		
	1000 HR _____ to _____		
	Shrub _____ to _____		
	Duff _____ to _____		

BURN SUMMARY:

Date _____	Time _____	Temperature _____	RH% _____
Windspeed _____	Direction _____	Flame Length _____	Scorch _____
Fuel Moisture (%):	1 HR _____ to _____	10 HR _____ to _____	
	100 HR _____ to _____	1000 HR _____ to _____	
	Shrub _____ to _____	Duff _____ to _____	

Smoke Management  marks: _____

DATE DECLARED OUT: _____ BURN BOSS SIGNATURE: _____

1. INTRODUCTION:

A. Purpose

You need to discuss why you want to burn; e.g. forest health, silviculture, wildlife, insects / disease, etc. Don't miss the opportunity to include as an objective the reduction of air quality impacts due to the controlled application of fire and smoke management. Example statement below:

"Wildland fire was once the most prevalent disturbance in Montana. Before the turn of the century, approximately half of western forests burned every 100 years and stands less than 40 years old made up one third of the forested landscape. Suppression of wildland fire has resulted in high fuel accumulations and a shift in forest stand composition and age structure. A combination of heavy forest fuels and periodic drought conditions has lead to disastrous and unpredictable wildfire conditions throughout the Beaverhead – Deerlodge National Forest. Wildfires occurring under these conditions are far more destructive than normal and are often extremely difficult or impossible to control. An extreme potential exists for property damage, air quality, public health, and visibility impacts caused by wildfires. Prescribed burning is the primary method of taking out underbrush, small trees, and dead wood on a regular basis to mitigate wildfire conditions while also mitigating the negative effects of smoke emissions on public health."

B. General Location (your information here)

2. ALTERNATIVES TO BURNING:

You need to discuss alternatives, if any, you considered as part of this burn. Alternatives to burning are becoming more important as air quality regulations become more stringent. Example statement of no alternatives chosen below:

"Alternatives to prescribed burning are applicable when fuel reductions are necessary for ecosystem or habitat management, or forest health enhancement. Alternative methods can be used to accomplish effects similar to what burning would accomplish when fire is used to eliminate an undesirable species or dispose of biomass waste. However, alternatives such as mechanical removal of forest biomass, use of grazing animals, and onsite chipping or crushing were determined to interfere with land management objectives for this project site. Alternatives would cause undue soil disturbance or compaction, stimulate alien plant invasion, impair water quality, or remove material needed for nutrient cycling or small animal habitat. Additionally, mechanical treatments require adequate road access which is not available on the project site"

3. TREATMENT OBJECTIVES:

A. General

In addition to your primary treatment objectives, you need to discuss your smoke management objectives. When you make a determination about your compliance with national ambient air quality standards (NAAQS) and visibility protection, remember other sources of air pollution exist in addition to the smoke from your burn on that day(s).

You must recognize that your burn is competing for available airspace with other emission sources such as residential woodstoves, vehicles, industry, agricultural windblown dust, etc. Your burn project may not consume all 150 micrograms of the 24-hour PM-10 standard. This is true even in remote areas. Example statement below:

“Based upon computer smoke dispersion modeling, smoke from this burn project will not cause or contribute to any NAAQS exceedance or interfere with any visibility protection control strategies.”

B. Specific

(your information here)

4. ENVIRONMENTAL REGULATIONS:

You need to outline all applicable environmental regulations such as streamside management zones (SMZ), endangered species, and water / air quality. If you are burning in Lincoln, Missoula, or Flathead County, you must follow those local air quality program regulations. Example statement and MT-DEQ regulations below:

“The USFS is a member of the Montana / Idaho Airshed Group, whose membership includes those agencies with an interest in the use of fire for resource management purposes and are committed to conserving Montana’s air quality. Montana is divided into 10 airsheds. This burn project is located in Airshed 7. The Montana Department of Environmental Quality (MT-DEQ) requires that members submit a list of planned burns to the Monitoring unit located in Missoula. From information contained in the permit application, the monitoring unit issues daily decisions in the fall season that can either restrict or permit burning to proceed / continue.

To protect Class I air-quality-related values, NAAQS, and visibility, this burn project will follow the state airshed group guidelines for best available control technology (BACT) and ensure that particulate concentrations do not exceed standards or impact visibility.

The burning seasons and notifications to be followed under MT-DEQ regulations are as follows:

- *During the period of December through February, no burning will be conducted as open burning is generally prohibited by state rule. Reference MT-DEQ air quality rule 17.8.606.*

- *Prescribed burn operations during the period of March through May, will conform to the guidelines applicable to the General Open Burning Season that requires good or excellent ventilation and other conditions as outlined in MT-DEQ air quality rule 17.8.606.*
- *Prescribed burn operations must conform with the Best Available Control Technology (BACT) year-round as outlined in MT-DEQ air quality rule 17.8.606 and any other conditions set forth in the permit.”*

5. AFFECTED ENVIRONMENT:

You need to describe the project area in general. This will assist in identifying sensitive features. Example statement below:

“The Elkhorn wildlife management burn project is generally located two mile north of Elkhorn Hot Springs and one mile west of Forest Service road #484. Many historical sites are located in proximity to the burn project, attracting many tourists year-round. Montana’s Territorial Capital, Virginia City, and Nevada City are all located south of the burn project. The community of Polaris (pop. ?) is located at the southern end of the Pioneer Mountains Scenic Byway, while Elk Horn Hot Springs resort and Maverick Mountain Ski Area are located within view of the burn project. The burn project is located in the mountain headwaters forming the Big Hole River which converge near the community of Jackson (pop. ?).

The communities of Butte (pop. 33,892) and Anaconda (pop. 9,417) lie north of the burn project and attract many tourists. The Pioneer Mountains Scenic Byway leads to the community of Wise River (pop. ?) with access to remnants of the Elkhorn Mill, the ghost town of Coolidge, and Crystal Park. The community of Wisdom (pop. 114) and the Big Hole National Battlefield, a historic site that memorializes the 1877 battle between the Nez Perce and Col. John Gibbon are located west of the burn project. The community of Dillon (pop. 3,752) lies east of the burn project, while nearby Clark Canyon Reservoir offers seasonal fishing, boating, and camping.

The Beaverhead County area is unique in that it is both cold and dry. Precipitation varies widely. Average annual amounts range from 10 inches in Dillon to over 50 inches in mountains forming the Continental Divide to the west. Two-thirds of precipitation in mountains is snow. Dillon averages 99 frost-free days annually. Cloudy weather rarely exceeds more than several days. Average annual temperature in January is 21°F and in July is 66°F.”

6. BURN AREA DESCRIPTION:

- A. Location
- B. Drainage
- C. Exposure
- D. Slope
- E. Size of burn area
- F. Elevation
- G. Fire behavior fuel model
- H. Fuel loading by class
- I. Target date
- J. Time of day

You need to decide how complex the topography is for purposes of smoke dispersion forecasting. Choosing the appropriate smoke dispersion model is based, in part, upon topography and elevation. Reference your Smoke Emissions and Dispersion Modeling course book for choosing the appropriate smoke consumption, emissions, dispersion, and visibility model.

7. BURN PRESCRIPTION:

- A. Air temperature
- B. Relative humidity
- C. 20-foot wind speed
- D. Fine dead fuel moisture
- E. Precipitation

See comments under “6. Burn Area Description” and “11. Environmental / Weather Conditions” and incorporate information relevant to smoke management under the appropriate subcategory.

8. PRESCRIBED FIRE BEHAVIOR:

- A. Predicted fire behavior
- B. Flame length
- C. Rate of spread
- D. Wind direction
- E. Smoke dispersion
- F. Fire characteristics
- G. Vegetation characteristics

See comments under “6. Burn Area Description” and “11. Environmental / Weather Conditions” and incorporate information relevant to smoke management under the appropriate subcategory.

9. SENSITIVE FEATURES:

Sensitive features include cultural / historical sites, endangered plant or animal species, private timber / range lands, noxious weed species, etc. Sensitive features must always include those features that may be affected by your smoke to a minimum 50 mile radius from your burn project. These may include air quality nonattainment areas, mandatory and designated Class I federal areas (select national parks, wildernesses, and Indian reservations for visibility protection), public roadways, airports, hospitals, retirement homes, recreation sites, residential home sites, etc. Example statement below:

“Sensitive features within 50 miles of this burn project includes many public recreation sites, particularly the Elkhorn Hot Springs resort. The spring season attracts many tourists to the area for late season snowmobiling, downhill and cross-country skiing, and early season trail hiking. Critical concern for this burn project is negative smoke impact on Beaverhead County Road #2 leading to the community of Polaris and Elkhorn Hot Springs resort. Additional concerns include smoke impacts to Montana Highway 43 that runs east-to-west within approximately 15 miles south of the project area.

Other sensitive features include the town of Dillon and Interstate Highway 15 located approximately 50 miles to the east and the historic town of Bannack located approximately 45 miles to the south. The communities of Wise River, Anaconda, and Gregson Fairmont Hot Springs are approximately 45 miles north of the project burn. The city of Butte, located approximately 40 miles northeast of the burn project, is a PM-10 nonattainment area. Computer smoke modeling indicates that smoke from this burn project is expected to have impacts of less than 5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) for 24-hour average in these communities. The Anaconda Pintler and Red Rocks Lake Wilderness Class I federal areas are located more than 100 miles from the burn project. Therefore, mitigation for visibility protection was not considered.”

10. SMOKE MANAGEMENT:

You need to qualitatively and quantitatively describe the air quality impacts from your burn project as best you can. Example statement below:

“For this project, the pollutant of concern is PM-10 (particulate matter with an aerodynamic diameter of 10 microns and less) and PM-2.5 (particulate matter with an aerodynamic diameter of 2.5 microns and less). The federal and state air quality standards for PM-10 are $150 \mu\text{g}/\text{m}^3$ for a 24-hour period and $50 \mu\text{g}/\text{m}^3$ annually. The federal air quality standards for PM-2.5 are $65 \mu\text{g}/\text{m}^3$ for a 24-hour period and $15 \mu\text{g}/\text{m}^3$ annually. Based upon a conservative estimation of smoke emissions, this project is not considered to cause or contribute to any NAAQS exceedances.

This 100-acre understory burn is schedule for ignition in early spring to take advantage of higher 1000- and 100-hour fuel moistures, while allowing for a higher spread component with lower 1- and 10-hour fuel moistures. Smoke production was calculated by a computer model at 1,500 pounds of PM-10 and 1,000 pounds of PM-2.5 for 24-hour

measurements at the maximum concentration site. The smoke dispersion model utilizing average springtime wind speeds, direction, and relative humidity demonstrated short-term impacts of $< 10 \mu\text{g}/\text{m}^3$ for 8 hours on local recreational activities to the south, but no significant impacts over a 24-hour period. The burn project was estimated to produce $25 \mu\text{g}/\text{m}^3$ of PM-10 and $20 \mu\text{g}/\text{m}^3$ of PM-2.5 over a 24-hour average at the maximum concentration site.

The closest ambient air quality monitoring stations are located at the West Fork Ranger Station and Butte, approximately 50 and 45 miles to the west and northeast, respectively. The five-year average particulate monitoring illustrates no human-caused exceedances of PM-10 or PM-2.5 NAAQS. Although this burn will contribute additional emissions to Airshed 7, other existing source emissions occurring during this burn are considered to be minimal. Tables 1-3 summarize the regional particulate matter monitoring information for the past five years below:

TABLE 1

BUTTE PM-10 ($\mu\text{g}/\text{m}^3$) 24-HOUR TEOM MONITORING VALUES¹

YEAR	1st HIGH	2nd HIGH	3rd HIGH	4th HIGH
1997	60	56	53	53
1998	173 ²	97	84	77
1999	91	62	60	60
2000	110	66	65	62
2001	78	69	66	63

¹ State and federal 24-hour PM-10 standard is $150 \mu\text{g}/\text{m}^3$.

² Value was flagged as an exceptional event caused by dust storm.

TABLE 2

BUTTE PM-2.5 ($\mu\text{g}/\text{m}^3$) 24-HOUR MONITORING VALUES¹

YEAR	1st HIGH	2nd HIGH	3rd HIGH	4th HIGH
1999	38.1	34.5	31.3	21.3
2000	34.4	30.5	30.5	27.6
2001	37.0	22.9	22.3	21.5

¹ Federal 24-hour PM-2.5 standard is $65 \mu\text{g}/\text{m}^3$.

TABLE 3**WEST FORK PM-10 ($\mu\text{g}/\text{m}^3$) 24-HOUR MONITORING VALUES¹**

YEAR	1st HIGH	2nd HIGH	3rd HIGH	4th HIGH
1996	81	28	27	14
1997	33	26	22	18
1998	50	46	39	23
1999	29	16	15	14
2000	37	15	11	10

¹ State and federal 24-hour PM-10 standard is $150 \mu\text{g}/\text{m}^3$.

11. ENVIRONMENTAL / WEATHER CONDITIONS:

You need to describe the burn project weather forecast and its role as a smoke management control strategy. Example statement below:

"A dispersion weather forecast will be performed to assess the dispersion capabilities of the atmosphere prior to ignition. Good or favorable dispersion capabilities will allow the burn project to occur without endangering NAAQS or visibility protection, provided the amount of prescribed burning does not overload the ability of the atmosphere to disperse the smoke emissions. The capacity of the atmosphere to disperse smoke emissions from this burn project will be measured based upon three primary factors: atmospheric stability, mixing height, and transport wind speed.

Atmospheric stability is the tendency for vertical mixing of both the convective and non-convective emissions. The optimum weather condition for this burn project will be an unstable atmosphere to aid in good mixing of smoke plumes with little, if any, long-term high volumes of smoke. Strongly unstable conditions are not favored due to fire hazards associated with high rates of spread.

Mixing height is that height through which the mixing process is relatively complete. This condition changes markedly during the course of a day. This burn project will be conducted during an unstable atmosphere and the mixing height will be determined by comparing the current surface temperature with the upper-air temperature profile measured during the morning hours.

Transport wind speeds refers to the average diluting wind speed within the smoke-laden layers of the atmosphere. Pollutants within the mixing layer are directly diluted by the transport wind speed. The Smoke Management Program in Missoula will assist the District in determining the metrological conditions favorable for the burn project."

12. RISK ANALYSIS:

You need to determine the burn project risk of escape (high, medium, low) for economic, political, and social consequences pursuant to FSM 5142.1 guidelines. Include smoke management as an element for risk evaluation. Example statement below:

“This burn project has been rated as “high” for risk of escape. The computer modeling of smoke emissions indicates high concentrations of PM-10 in the vicinity of the Elkhorn Hot Springs resort occurring from approximately 18:00 to 20:00 on May 5, 2003. To mitigate impacts on public health, an air quality monitor was obtained from the Region 1 fire cache and established at the resort. PM-10 concentrations will be monitored every hour and this information will assist in determining any appropriate suppression action. Mop-up activity was elevated to category four to ensure residual smoke emissions would be minimized by 10:00 on May 6, 2003.”*

***EDITOR’S NOTE:** Although on-site monitoring may determine your smoke production to be minimal, the use of portable air quality monitoring equipment comes with the potential liability of regulatory actions associated with air quality exceedances, even with non-reference method monitoring equipment. Reference Montana ARM 17.8.132 Credible Evidence rule.

13. CONTINGENCY PLAN:

You need to address how you will address potential smoke dispersion situations where public health or roadways are being negatively affected. Example statement below:

“Should a smoke dispersion situation exist that negatively affects public health, roadways, or other sensitive features, the burn boss will immediately take the appropriate suppression action (confine, contain, control) to reduce smoke emissions to the point where the negative impacts are eliminated.”

14. SAFETY PLAN:

- A. Pre-burn briefing
- B. Ignition / holding / mop-up
- C. Personal safety equipment
- D. Communications
- E. Public safety

You need to ensure the public is aware of your burn project under “E” above. You may notify the public using mass media, bulletin board posters, personal contacts, and/or road signs. Smoke impacts in residential areas, on roadways, or in Class I areas are of greatest concern. Additionally, public health notification is important for large, multiple-day burning. Portable air quality monitors are available from the Region 1 fire cache in Missoula. Example statement below:

“To deter the public from entering the project area during ignition, all access points into the area will be posted with road signs alerting travelers of the intended action. The project area will be inspected prior to ignition for unauthorized individuals. Individuals will be instructed to leave, and owners of property will be notified to remove items prior to ignition.

Weather conditions, fuel loading, fuel composition, and proximity to a fire are important factors that affect the smoke concentrations in a particular area. An air quality monitor will be established at Elkhorn Hot Springs resort to measure concentrations at specific intervals during the day and night of the predominant pollutant in wildfire smoke that affects health and visibility. Information obtained from this monitor will be used to compare local air quality to federal and state health standards.”

15. PUBLIC INFORMATION / PRE-BURN CONTACTS:

- A. State and county air quality personnel
- B. Local media
- C. County public information officer
- D. County dispatch center
- E. County Sheriff's department
- F. Local fire districts
- G. Applicable local fire departments
- H. Local residents/adjacent landowners

Include your airshed coordinator as a contact in addition to the Smoke Management Program Coordinator, (406) 329-4952. For purposes of smoke management contingency planning, list the state air quality meteorologist, (406) 444-5272, and your county sanitarian.

16. PRE-BURN WORK LIST:

- A. Burn plan approved
- B. Site preparation
- C. 10-hour fuel sticks in place
- D. Area weather forecasts
- E. Identify water sources
- F. Inform local fire districts, communications, and residents
- G. Identify access / egress and potential hazards
- H. Notify City / County public health office
- I. Burn team assembled / briefed
- J. Contingency plan / safety zones identified
- K. Any site specific needs identified
- L. Economic data

See comments from previous sections and incorporate information relevant to smoke management under the appropriate subcategory.

17. ORGANIZATIONAL STRUCTURE:

- A. Prescribed fire burn boss
- B. Public information officer
- C. Resource advisor
- D. Safety officer
- E. Ignition specialist
- F. Holding boss
- G. Holding crew
- H. Mop-up crew
- I. Field observers

You should mention that smoke management is everyone's responsibility. Each assignment needs to be properly implemented to mitigate smoke emissions.

18. IGNITION PLAN SUMMARY:

- A. Personnel
- B. Ignition equipment
- C. Ignition time
- D. Ignition type / sequence
- E. Test fire

You should mention that smoke management is everyone's responsibility. Each assignment on the ignition team needs to be properly implemented to mitigate smoke emissions.

19. HOLDING PLAN SUMMARY:

- A. Personnel
- B. Holding equipment
- C. Water sources
- D. Contingency plan

You should mention that smoke management is everyone's responsibility. Each assignment on the holding team needs to be properly implemented to mitigate smoke emissions.

20. MOP-UP AND PATROL PLAN SUMMARY:

- A. Personnel
- B. Mop-up equipment
- C. Standards & techniques

You should mention that smoke management is everyone's responsibility. Each assignment on the mop-up team needs to be properly implemented to mitigate smoke emissions.

21. POST-BURN EVALUATION:

- A. Comment and observation
- B. Photos (pre, during, post)
- C. Economic data

You need to summarize how the burn project progressed with regard to smoke management. Photographs are very important to document activity and protect against any potential liability situations. Example statement below:

“The Elkhorn Wildlife Management Burn was ignited on May 5, 2003 at 10:30. Ignition strategy was a strip-head backfire on upper 1/3 unit – with a center fire / jackpot ignition strategy for the middle and lower 1/3 unit. Heat was quickly generated and the resulting smoke emissions broke the early morning mountain inversion and dispersed into the atmosphere without affecting sensitive features. See attached time-sequenced photographs. Ignition followed a determination by the burn boss that all required prescription elements were met for fuel moistures, relative humidity, ambient temperatures, eye-level and 20-foot windspeeds, and smoke management program burn authorization.

Flaming phase for this burn project lasted approximately until 13:00 with an intense smoldering phase lasting until 17:00. Cooler nighttime temperatures and diurnal winds pulled remaining smoke emissions down-canyon toward Elkhorn Hot Springs resort. The monitoring station located at the resort indicated PM-10 emissions peaked at 20 $\mu\text{g}/\text{m}^3$ at 17:30, dissipating to 5 $\mu\text{g}/\text{m}^3$ by 20:00 (strip chart included in Appendix “R”). These smoke concentrations were within the expected parameter and caused no public health or visibility concerns. Mop-up category four was rigorously pursued beginning on May 6, 2003 at 06:00 that resulted in no detectable smoke emissions by 10:00.

NOTE: *Future agency burns in this area should be aware of rapid change in local temperature and windspeed following the burn period. Holding crews should be positioned to secure line on all sides of the burn project. Two phone calls were received regarding this burn project. Mrs. Johnson (406) 555-1224 and Mr. Smith (406) 555-4567 from Polaris expressed concern about fire severity and their adjacent livestock and timber interests. Additionally, Mr. Johnson has severe asthma and needs time to leave the area before burns are ignited. Contact these individuals prior to any future burns in this area.”*

22. MAPS:

In addition to project level maps, you should include a general vicinity map and highlight sensitive features and approximate distances to each. Clearly identify administrative boundaries such as airsheds and land ownership.

23. REFERENCES:

- Acheson, A., Hammer, B., Stanich, C. and Story, M. 2000. Describing Air Resource Impacts from Prescribed Fire Projects in NEPA Documents for Montana and Idaho in Region 1 and Region 4. 36 p.
- NWCG. 2001. Smoke Management Guide for Prescribed and Wildland Fire 2001 Edition. PMS 420-2 NFES 1279. 226 p.
- USDI/USDA. 1995. Federal Wildland fire management policy and program review. Final report. National Interagency Fire Center, Boise, ID. 45 p.
- USEPA. 1992. Prescribed Burning Background Document and Technical Information Document for Prescribed Burning Best Available Control Measures. EPA-450/2-92-003.
- Zimmerman, G. T. and Bunnell, D.L. 1998. Wildland and Prescribed Fire Management Policy – Implementation Procedures Reference Guide. Interagency publication. 92 p.

Reference all relevant documents that support your actions for this burn project to reduce any potential liabilities associated with smoke management and any other burn-associated effects.

24. APPENDICES:

- A. Smoke Management Program Authorization
- B. Emission Reduction Techniques
- C. Burn Organization
- D. Prescribed Fire Qualifications
- E. Overhead Check List
- F. Burn Boss Check List
- G. Health and Safety Hazard Analysis
- H. Probability of Ignition
- I. Information and Involvement Plan
- J. Guidelines for Escape and Consequence Assessment
- K. Complexity Elements Worksheet
- L. BEHAVE Computer Runs
- M. CONSUME Computer Runs
- N. SASEM Computer Runs
- O. FOFEM Computer Runs
- P. RXWINDOW Computer Runs
- Q. Post Burn Evaluation Photos
- R. Elkhorn Hot Springs Resort Monitor Strip Chart

Appendix all relevant information that support your actions for this burn project to reduce any potential liabilities associated with smoke management and any other burn-associated effects.

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